

Translation

PATENT COOPERATION TREATY

PCT/JP2003/004125



# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference M720-PCT	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/JP2003/004125	International filing date (day/month/year) 31 March 2003 (31.03.2003)	Priority date (day/month/year) 29 March 2002 (29.03.2002)
International Patent Classification (IPC) or national classification and IPC .H01L 21/316		
Applicant TOKYO ELECTRON LIMITED		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.  
☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
These annexes consist of a total of \_\_\_\_\_ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 06 August 2003 (06.08.2003)	Date of completion of this report 02 March 2004 (02.03.2004)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/JP2003/004125

## I. Basis of the report

### 1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☐ the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the claims:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement under Article 19  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the drawings:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

### 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/JP03/04125

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	2, 7	YES
	Claims	1, 3-6	NO
Inventive step (IS)	Claims		YES
	Claims	1-7	NO
Industrial applicability (IA)	Claims	1-7	YES
	Claims		NO

### 2. Citations and explanations

Document 1: US, 2002-0014666, A1 (Tadahiro Ohmi), 7 February, 2002 (07.02.02)

Document 2: JP, 2000-294550, A (Tokyo Electron Ltd.), 20 October, 2000 (20.10.00)

Document 3: JP, 2001-111000, A (Samsung Electronics Co., Ltd.), 20 April, 2001 (20.04.01)

The subject matters of claims 1 and 3-6 do not appear to be novel in view of document 1 or 2 cited in the ISR.

Document 1 cited in the ISR describes a method for forming a semiconductor device wherein an oxidized-silicon film and then a nitrogenized-silicon film having a high dielectric constant are formed on the silicon wafer by means of a plasma processing apparatus equipped with a radial line slot antenna.

Document 2 cited in the ISR describes a semiconductor manufacturing method containing (1) a process wherein a substrate to be treated that has silicon as the principal component is irradiated with microwaves via a planar antenna member in the atmosphere of the treating gas to form a plasma containing oxygen, and that plasma is used to directly oxidize the surface of the said substrate to be processed to form an oxidized-silicon film on that surface, and (2) a process wherein a nitrogenized-silicon film is formed on the said oxidized-silicon film.

The subject matters of claims 2 and 7 do not appear to involve an inventive step in view of documents 1-3 cited in the ISR. Document 3 cited in the ISR discloses a semiconductor element wherein a stable layer of oxidized-silicon film to make the surface of a silicon substrate hydrophilic is formed on the substrate, and a gate-insulation film composed of an aluminum oxide,  $\text{HfO}_2$ ,  $\text{ZrO}_2$ , etc., is formed on the said stable layer.